

Notice of Allowability

Application No.

10/654,971

Examiner

Henry S. Hu

Applicant(s)

ARAKI ET AL.

Art Unit

1713

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to RCE of October 24, 2006.
2. ☒ The allowed claim(s) is/are 1-4 and 6-17.
3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☒ All b) ☐ Some* c) ☐ None of the:
 1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____

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1. This application is in condition for allowance except for the presence of **Claims 18-22 (Group II)**, which is non-elected without traverse as filed on December 2, 2005. **Non-elected species Claims 11-17 are rejoined with Claims 1-10 (Group I) by Examiner based on the fact that parent Claim 1 along with its elected species Claims 9-10 are allowed.** Accordingly, **Claims 18-22 have been cancelled.** An action follows.

EXAMINER'S AMENDMENT

2. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.

The examiner has cancelled the above-mentioned **Claims 18-22**, which are non-elected without traverse by Attorney **Abraham J. Rosner** (registration # 33,276) on December 2, 2005.

Claims 18-22 are cancelled.

DETAILED ACTION

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3. Applicants' **RCE** request along with its **Amendment** filed on October 24, 2006 was received. **Claim 1 was amended; Claim 5 was cancelled, while no new claim was added.** To be more specific, parent **Claim 1** was amended to incorporate the limitation of **Claim 5** as "the prepolymer (I) now contains repeating units having a cure site comprising a carbon-carbon double bond in a side chain of the polymer and/or at an end of a trunk chain of the polymer in an amount of not less than 0.1 mol % based on all structural units constituting the prepolymer (I)". Claim 5 was cancelled and the claim dependency of Claim 6 was corrected accordingly.

With above Examiner's amendment, non-elected **Claims 18-22** were cancelled. As discussed earlier, the examiner **accepts Applicants' drawing in one sheets with one figure** filed on September 5, 2003 along with this application (brief description is on page 8). **Claims 1-4 and 6-17 are now pending** with only one independent claim (**Claim 1**). An action follows.

4. Claim rejections in previous Final Office Action filed on May 24, 2006 are now removed for the reasons given in paragraphs 5-11 thereafter.

Allowable Subject Matter

5. Claims 1-4 and 6-17 are allowed.

6. The following is an examiner's statement of reasons for allowance: The above Claims 1-4 and 6-17 are allowed over the closest references:

7. The limitation of parent **Claim 1** in present invention relates to a fluorine-containing resin composition comprising (I) a fluorine-containing prepolymer and (II) a compound containing a rare earth metal ion and/or a rare earth metal element, wherein

(1) the fluorine-containing prepolymer (I) is a non-crystalline polymer having a fluorine content of not less than 25 % by weight and

(2) the fluorine-containing prepolymer (I) contains repeating units having a cure site comprising a carbon-carbon double bond in a side chain of the polymer and/or at an end of a trunk chain of the polymer in an amount of not less than 0.1 mol % based on all structural units constituting the prepolymer (I).

The polymers as described in dependent Claims 8-14 have a general formula of $CX^1X^2=CX^3-(CX^4X^5)_a-(C=O)_b-(O)_c-Rf$ wherein the factors of X^1 and X^2 can be the same or different from H or F; X^3 is H, F, CH_3 or CF_3 ; X^4 and X^5 can be the same or different from H, F or CF_3 ; Rf can be organic group (Y)-containing alkylene or alkylene ether; and a is integer of 0-3, while b and c can be 0 or 1. See other limitations of dependent Claims 2-4, 6-7 and 15-17.

8. Applicant has claimed in original parent **Claim 1** an unexpected way of obtaining a fluorine-containing resin composition comprising two things as: (I) a fluorine-containing **“prepolymer”** and (II) a compound containing a rare earth metal ion and/or a rare earth metal element. Such a fluorinated prepolymer is required as: (A) being non-crystalline, (B) having a fluorine content of not less than 25 wt %, and (C) having a cure site. With this RCE amendment, parent Claim 1 was once-amended to incorporate the limitation from **Claim 5**

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as “prepolymer (I) contains repeating units having a cure site comprising a carbon-carbon double bond in a side chain of the polymer and/or at an end of a trunk chain of the polymer in an amount of not less than 0.1 mol % based on all structural units constituting the prepolymer (I)”; the scope of current parent claim 1 is indeed narrowed down from original parent Claim 1.

With respect to 102 rejection for Claims 1-7, it is premature to conclude (see page 9 of Remarks) that **Kolke**’s fluorinated copolymers having non-fluorinated comonomer(s) may carry on main chain as pendant group or end group some functional group and/or some residual carbon-carbon double bond, which are capable of crosslinking. Koike may have disclosed non-crystallinity on fluoropolymer, but does not disclose using a cure-site anywhere in polymer at all.

9. With respect to 103(a) rejection for Claims 1-10, primary reference **Fryd** is totally relying on secondary reference Koike’s teaching to make a composition for making a light transmitting device prepared by mixing a non-crystalline perfluoropolymer containing no C-H bond with a fluorinated metal-betadecarbonyl chelate compound. Koike does not disclose or suggest the curing or curability of a composition comprising a non-crystalline fluoropolymer and chelate compound. Therefore, Kolke cannot fix the deficiency of Fryd in amended claim limitations. In summary, a motivation to link Koike with Fryd is missing.

10. It is known in the art that even the difference is only one carbon atom in the composition or a tiny extra step in making, the final polymeric products can be with very much different properties. It is well known in the art that a curable prepolymer having such a curable

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carbon-carbon double bond in such a minimum amount such as NOT LESS THAN 0.1 mol% is quite different from the compositions cited by references. Additionally, the present invention has already shown **unexpected results** in examples along with some control examples for making such a curable fluorinated resin composition (see pages 70-94 for **examples 1-17 with control and Tables 1-4**). Therefore, all the above-mentioned references, in combination or alone, does not teach or fairly suggest the limitations of present invention. The Examiner confirms that two A-references are cited on the search report for this Application's priority document **EP 1,375,598 A1 (JP 2001064770)**.

11. After further examination and search, the examiner found the following prior art did not teach the claimed limitation:

US Patent No. 6,176,895 B1 to DeSimone et al. only discloses the use of ligand-containing polymer to extract metal ions in liquid or supercritical carbon dioxide, wherein the ligand bound to the polymer is at a plurality of locations along the chain length (abstract, line 1-15; Figure 1; column 2, line 25-65). **Ligand may be in various types including include beta-diketone, phosphate, phosphonate or others (column 4, line 7-41). Some fluorinated polymers may be used (column 4, line 1-6). However, the claimed fluorine content of not less than 25 wt% is not disclosed; the cure site containing carbon-carbon double bond in an amount of not less than 0.1 mol % is not existed; and such fluoropolymers are only related to acrylate type (not within the scope of a = 1-3; b = 0, c = 1) according to the disclosure from the two US patents cited therein.**

EP Patent No. 622,878 A1 to Sharma et al. only discloses a composition by dissolving a rare earth metal complex into a polymeric matrix (abstract, line 1-3). The complex compound is made from coordination of **beta-dicarbonyl** functional groups to erbium metal ion (page 3, line 6-19).

US Patent No. 6,292,292 B1 to Garito et al. only discloses the preparation of polymers having attached optical amplifying erbium metal complex, wherein the complex is made from coordination of **phosphinate** functional groups to erbium metal ion (abstract, line 1-20; Figure 1; column 2, line 40-56). The claimed fluorine content of not less than 25 wt% is not disclosed. No metal-dicarbonyl chelating is used at all. The cure site containing carbon-carbon double bond in an amount of not less than 0.1 mol % is not existed.

12. The key issue on making a curable fluorinated resin composition by combining a pre-polymer with a compound containing a rare earth metal ion or element, wherein pre-polymer's cure site contains carbon-carbon double bond in an amount of not less than 0.1 mol %, cannot be overcome by any or the combination of the above references, therefore, the present invention is novel.

13. As of the date of this office action, the examiner has not located or identified any reference that can be used singularly or in combination with another reference including the above references to render the present invention anticipated or obvious to one of the ordinary

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skill in the art. Therefore, the one independent **Claim 1** is allowed for the reason listed above.

Since the prior art of record fails to teach the present invention, the remaining pending dependent

Claims 2-4 and 6-17 are passed to issue.


14. Any inquiry concerning this communication or earlier communication from the examiner should be directed to **Dr. Henry S. Hu** whose telephone number is **(571) 272-1103**. The examiner can be reached on Monday through Friday from 9:00 AM –5:00 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu, can be reached on (571) 272-1114. The fax number for the organization where this application or proceeding is assigned is **(571) 273-8300** for all regular communications.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Henry S. Hu

Patent Examiner, art unit 1713, USPTO

December 22, 2006


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